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Inflammation of the frontal intersinus septal air cell as a cause of headaches

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ABSTRACT

INTRODUCTION: The aim of this paper is to present a rare case of frontal intersinus septal air cell inflammation as a cause of headaches.**PRESENTATION OF CASE:** A 23-year-old patient was admitted to the Department of Otolaryngology and Laryngological Oncology for severe headaches during an upper respiratory tract infection. After neurological consultation including brain MRI and CT scanning of the paranasal sinuses, the inflammation of the frontal intersinus septal air cell was diagnosed. After examination, the patient was qualified for external osteoplasty. Under general endotracheal anaesthesia, the frontal intersinus septal air cell was intraoperatively opened from the side of the right frontal sinus, the mucoid content was aspirated and a plate of bone was removed. The patient reported complete relief from headaches on the second day after surgery.**DISCUSSION:** According to the previous studies, the frontal intersinus septal cell is more frequent in patients with frontal sinus inflammation than in the patients without inflammatory changes. Further, the conducted research indicates that its occurrence does not result in significant disorders in the drainage and ventilation of the frontal sinuses, and as such is not likely to be the cause of inflammation.**CONCLUSION:** In the case of inflammatory changes in the frontal intersinus septal air cell without concomitant frontal or ethmoid sinusitis, surgery via the external approach appears to be an effective method for the radical removal of pathological changes.© 2014 The Authors. Published by Elsevier Ltd. on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

1. Introduction

Pneumatization at the border of the frontal and ethmoid sinuses is highly variable and can take many anatomical forms. Different groups of air cells can be distinguished: agger nasi cells, type 1–4 frontal cells, supraorbital ethmoid cells, suprabullar cells, frontal bullar cells and intersinus septal cells. Knowledge of the structure of this region is essential for the planning and performance of surgical treatment in pathologies of the frontal and ethmoid sinuses. The air cell within the frontal intersinus septum is also referred to in the literature as an “interfrontal sinus septal cell” or “frontal wishbone”. Studies have shown that approximately one third of the population possess a pneumatized cell between the frontal sinuses, which some researchers believe to be an ethmoid cell entering between the frontal sinuses. However, other studies indicate that this is a diverticulum of the frontal sinuses.^{1,2} The aim of the present

study is to present a rare case of frontal intersinus septal air cell inflammation as a cause of headaches.

2. Presentation of the case

A 23-year-old patient was admitted to the Department of Otolaryngology and Laryngological Oncology complaining of severe headaches with no specific location which had persisted for up to 3 months. The pain appeared during the course of an upper respiratory tract infection. Antibiotic therapy and anti-inflammatory drugs were prescribed by a family doctor. Although the symptoms related to the infection were alleviated by the treatment, the headaches intensified. On the second visit, other antibiotic and anti-inflammatory drugs were administered, together with mucolytic drugs. Although the pain slightly decreased, it was strong enough to make normal functioning impossible and required a high dose of analgesics. After neurological consultation, a brain MRI revealed the presence of a clearly outlined lesion in the frontal sinuses, but no cerebral aberrations. A laryngological consultation was requested. A three-dimensional CT scan of the paranasal sinuses was performed (Fig. 1), which showed signs of inflammation within the frontal intersinus septal air cell. The lumen of the cell was found to

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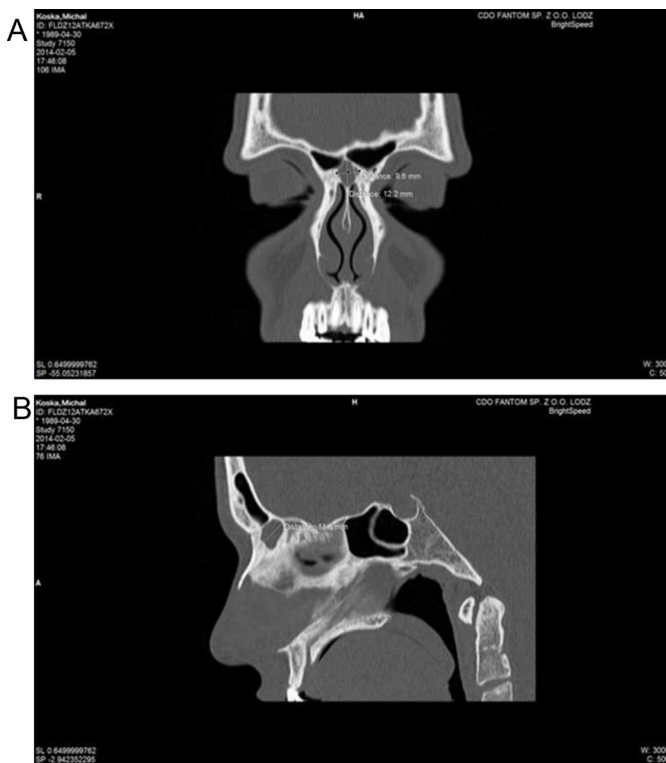


Fig. 1. CT images before surgery: A – coronal view, B – lateral view.

be filled with thick mucus, which according to some of the scans, may have been connected with the right frontal sinus. No pathological changes were observed in the other paranasal sinuses.

A thorough ENT examination did not reveal any disorders. The patient was qualified for surgical treatment via the external osteoplastic approach. Under general endotracheal anaesthesia, the frontal intersinus septal air cell was intraoperatively opened from the right frontal sinus, and the mucoid content was drained. A plate of bone was completely removed from the right frontal sinus. Normal patency of the right frontal sinus ostium was achieved. The plate of bone was stabilized, a drain placed into the sinus, and the skin sutured. The patient's headaches were relieved completely on the second day after surgery.

CT scan of the paranasal sinuses 2 weeks after the surgery (Fig. 2).

3. Discussion

Although the frontal intersinus septal air cell is relatively common, its pathologies are extremely rare. Only a few descriptions of this pathology can be found, and in these cases, it usually causes or coexists with an inflammation of one or both frontal sinuses. While the symptoms reported by patients are typical of inflammatory changes in the frontal sinuses, no such history of paranasal sinus inflammation was observed in the present case. The only symptoms were severe headaches; moreover, the patient was not able to indicate the location of the pain.³

In the available literature, the intersinus septal cell (ISSC) is classified into two types. The type 1 ISSC is connected with one or two frontal sinuses, and, according to many authors, appears to be a diverticulum of the frontal sinuses. The type 2 ISSC merges with the frontal recess and can originate from the ethmoid sinus.

The clinical consequence of this classification may be the choice of surgical access. As the type 2 ISSC is merged with the frontal recess, it can be removed endoscopically relatively easily. In the

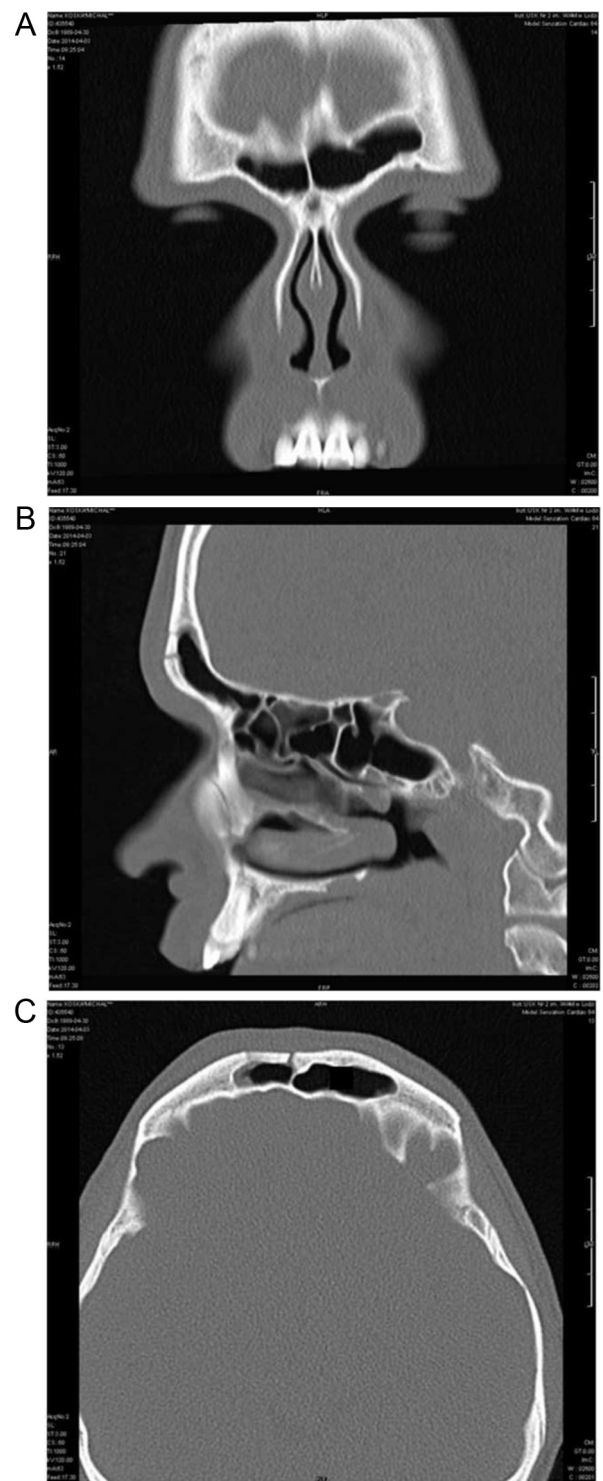


Fig. 2. CT images after surgery: A – coronal view, B – lateral view, C – axial view.

case of type 1, endoscopic access is much more difficult, and external access or combined endoscopic-external access is generally recommended. As in the presented case, the ISSC was classified as type 1, it was decided that external access would be the most suitable method, considering the location of the ISSC and the lack of any inflammatory changes in the frontal and ethmoid sinuses.^{4,5}

Previous studies do not suggest that the frontal intersinus septal cell is more frequently found in patients with frontal sinus inflammation than in those without inflammatory changes. Similarly, research indicates that its occurrence does not result in significant

disorders in the drainage and ventilation of the frontal sinuses, and so is not likely to be the cause of inflammation.⁶

4. Conclusions

Isolated inflammatory changes involving the frontal intersinus septal air cell are a rare pathology. In the case of these occurring without concomitant frontal or ethmoid sinus inflammation, surgery via the external approach appears to be an effective method of radical removal of pathological changes.

Conflict of interest

None.

Funding

None.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of

the written consent is available for review from the Editor-in-Chief of this journal on request.

Authors contribution

Jaroslav Milonski has contributed to the study design while Piotr Pietkiewicz was involved in collecting data. Joanna Urbaniak contributed to the study analysis, Krzysztof Kusmierczyk prepared the literature and Jurek Olszewski was involved in preparing the concept of the work and writing.

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